

MEDICAL ADVISORY COMMITTEE

MESOPOTAMIA INQUIRIES.

Report on Remaining inspections.

(EUPHRATES AND KARUN.)

December 20th, 1916—January 12th, 1917.



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December 20th, 1916 to January 12th, 1917.

To

SURGEON GENERAL TREHERNE, C. M. G.,

Director, Medical Services, Indian Expeditionary Force, "D".

SIR,

We beg to report that we visited the 15th Division at Nasiriyah (December 20th to 24th); posts on the Euphrates between Nasiriyah and Hammar Lake (December 26th to 28th) and went thence, after a brief stay at Basrah, to Ahwaz (Karun Front force). We also visited Muhammerah.

1. As in previous inspections, we have discussed sanitary and preventive measures on the spot with the officers concerned before leaving the area, and have given written memoranda on certain of the matters to the Assistant Director, Medical Services, or Senior Medical Officer, concerned.

We have also conferred with the Deputy Director, Medical Services, Lines of Communication, on questions arising out of these inspections.

2. Copies of the memoranda referred to are annexed as appendices to this report, viz:—

Appendix 1. Nasiriyah.

2. Euphrates Posts.

3. Ahwaz (Karun).

4. Muhammerah.

and little need here be added.

15TH DIVISION, NASIRIYAH.

3. This division, relatively to other divisions of the force, has a good health record. It has had less active military strain than divisions on the Tigris, and preventive work, under the good guidance of the Assistant Director, Medical Services, Colonel Irvine, I. M. S., ably assisted by Captain Mitchell, R. A. M. C., has benefited by this circumstance.

4. It is noteworthy that in this force there has been little *scurvy* by comparison with corresponding divisions on the Tigris during 1916. Three divisions in the latter force contributed over 7,000 cases from July to August inclusive. In the 15th Division (total Indian strength usually about 12,000) for the last six months of 1916, about 250 Indian fighting men and followers were diagnosed as suffering from scurvy, and many of these cases were slight. The largest number of scurvy cases in a unit occurred in the 43rd Erinpuras, a regiment which arrived at Nasiriyah in April from Ahwaz where many of the men had already contracted scurvy. Two other units contributed materially to the total, the 112th Infantry (at Khamisieh, not visited) and the 2/48th Pioneers. The latter had been road-making in the summer in places some distance from the town, under conditions involving an exceptional degree of fatigue and where no supply of fresh vegetables could be obtained. In many instances those attacked were Jats who seldom took the fresh meat ration (see also Appendix 2, paragraph 2).

For the division as a whole there has seldom been any failure in the supply either of meat or vegetables. The latter are obtained in considerable quantities by local purchase.

5. The detection of *Oriental Sores* (*Leishmania*) at Nasiriyah (Appendix 1, paragraph 5) deserves notice, as previously the nature of these sores had not been ascertained. We are forwarding a note on this affection which would serve, if desired, for general circulation to medical officers. (Appendix 7).

6. In regard to our observations as to *water-supply* and *purification* at Nasiriyah and the Euphrates posts (Appendix 1, paragraphs 9, 11) it should be added that Captain Morison of the Basrah Central Laboratory is now at Nasiriyah to advise on this matter in detail.

7. We draw special attention to the suggested *railway steam disinfection van* (Appendix 1, paragraph 19). Our experience of its great practical value on the Suez Canal railway leads us to press for such a van or vans being supplied both on the Euphrates and the Tigris lines. They can be very simply made by fitting an ordinary closed van with shelving and introducing steam pipes into which the locomotive steam is directed.

8. The general arrangements for the work of the *Sanitary Section* in Nasiriyah did not seem to us very satisfactory.

If our suggestion be adopted that the services of the Officer Commanding this section, Major Patton, I.M.S., be utilised for special entomological and other expert work, it would be well that the officer appointed to succeed him should take up duty as soon as possible so as to get the organisation of the section well in hand before the spring.

9. The Army Commander having asked to be informed of instances of bad *sanitary discipline*, we draw attention here to our observations (Appendix 1, paragraph 16) on the camp of B. Battery, 222 Royal Field Artillery.

KARUN FORCE, AHWAZ.

10. At Ahwaz we found also a relatively good health record, to which the steps taken by the General Officer Commanding, Brigadier-General Younghusband, to provide mud brick hutting, the large vegetable garden, etc., have in all probability materially contributed. It will be noted that various sanitary improvements will be taken in hand now that a Field Engineer has been attached to the force. We understand that some delay in obtaining material from Basrah may occur from the circumstance that the Karun force for military purposes comes directly under General Headquarters. We trust that this will entail no delay in obtaining the material in question, including the articles (water carts; bath tubs, etc., Appendix 3, paragraphs 13 and 14) the supply of which we undertook to recommend.

11. On the question of giving leave to Medical officers in the 4th C. F. A. who have already been two summers in Mesopotamia (Appendix 3, paragraph 11), we note that we have seen the same need elsewhere, and that the matter has a general application to the whole force and to all ranks. We understand that comprehensive proposals are being made by the Army Commander in this matter. It seems very important to have a general system of what may be termed "preventive" or "recuperative" leave after a prolonged period of service in Mesopotamia, which can be taken as a matter of course without raising the question of the willingness of the individual to acknowledge that he needs physical or mental rest.

OIL-DRIP COOKING FOR INDIAN TROOPS.

12. It is usually stated to be useless to meet the difficulty of obtaining wood for Indian cooking by the substitution of oil fuel, because of the great conservatism of the Indian in his methods of preparing food. It is therefore interesting to note that an Indian detachment at the Anglo-Persian Oil Company's works has adopted cooking pits in the ground which are heated by oil drips and they are said now to prefer the oil to the wood. Captain Radcliffe-Smith, Karun Force Staff, gave us a note of the method (Appendix 5) and Brigadier-General Younghusband undertook to have it introduced experimentally on a large scale at Ahwaz. This trial will be valuable, and its results should be ascertained at an early date. Some means may be found of dispensing with the stop-cock, *e.g.*, by using a kerosine tin with hole and peg like that employed as a "drip-can" for oiling mosquito pools ("Memoranda on Medical Diseases of the Mediterranean War Area," page 77). The important matter is to ascertain the most ready and acceptable method and then freely to circulate the information, together with any short pipe lengths, iron plates, etc., which are necessary.

13. Other observations and recommendations in the appended memoranda do not call for additional comment.

FURTHER WORK OF THE COMMITTEE.

14. We are now obtaining some information at Basrah on the present position of certain general matters (*e.g.*, supplies, works, medical stores, hospital ships and trains and other preparations for the coming spring and summer), so as to get information to date as to recent progress. This done, the Committee would propose to go to India (as already instructed), to visit Army Headquarters and confer with the Army Medical authorities as to matters on which information is required from India. They will forward from there a brief concluding report on outstanding points, before returning to Egypt. If it meets the views of the Army Commander and Director, Medical Services, the Committee will notify Lines of Communication when they are ready to leave for India, and proceed accordingly.

EPITOME OF REPORT FOR USE IN TELEGRAPHIC SUMMARY.

15. Medical Advisory Committee report on inspection of forces on Euphrates and Karun—health of both forces has been good though prevalence and prevention of enterica infections need attention—Jaundice prevalent but type mild—some smallpox at Ahwaz—Hospitals satisfactory as also convalescent depôts at Muhammerah—Report deals with various details of sanitary improvement requiring or receiving attention—General points raised are similar to those of Committee's Lines of Communication Report November—Vaccine lymph often unsatisfactory—its despatch from India and distribution need attention—More microscopes required—Railway steam disinfecting vans as in Egypt should be provided—Simple method of using oil fuel for Indian cooking being tried at Ahwaz and promises important results—Systematic recuperative leave to men after certain period of service in Mesopotamia most advisable on medical grounds—Committee's inspections concluded—returning Egypt *via* India.

A concluding report on outstanding matters affecting Mesopotamia to be sent from India.

We have the honour to be,

SIR,

Your obedient, Servants,

ANDREW BALFOUR, LIEUT.-COLONEL,
R. A. M. C.

G. S. BUCHANAN, LIEUT.-COLONEL,
R. A. M. C.

J. C. G. LEDINGHAM, LIEUT.-COLONEL,
R. A. M. C.

C. M. WENYON, LIEUT.-COLONEL,
R. A. M. C.

BASRAH,

The 16th January 1917.

Appendix 1.

15TH DIVISION : MEMORANDUM ON MISCELLANEOUS MATTERS ARISING OUT OF INSPECTIONS AND ENQUIRIES AT NASIRIYAH, DECEMBER 21ST-24TH 1916.

1. The Committee will, in due course, report on the 15th Division as a whole: we would however state here that the general character of the medical and preventive work as seen in Nasiriyah has been distinctly good, and that there has been very satisfactory evidence of good initiative both at hospitals and Field Ambulances and in regard to the general principles of sanitation. The prevalence of disease and their causes are closely watched and excellent records and statistics have been furnished to us.

The following are notes on miscellaneous matters discussed with the Assistant Director, Medical Services, or other officers concerned, and recorded for convenience before the Committee leave for Basra and Ahwaz.

DISEASES.

2. *Enterica and Dysentery*.—The prevalence of infections of the Enteric and Dysentery groups calls for notice, although there is no pronounced epidemic of either group of diseases. Preventive measures, including isolation and hospital arrangements, are generally good. Much of the infection has probably been fly-carried and in certain units has been attributable to present arrangements for incineration which permit access of flies to human faeces for a considerable period before incineration takes place. This was specially noted in the conservancy area on the right bank adjoining the 1/4th Dorsets, the Artillery camp and the 48th Pioneers, all of which had been disproportionately attacked by the diseases in question.

For improvements needed in these respects see paragraphs 13 to 18 below.

3. *Malaria*.—Major Christophers, I. M. S., has already reported on the malarial possibilities in the Nasiriyah district. It would seem that the locality is far from being intensely malarious, and that the number of native reservoirs of infection is inconsiderable. *Anopheles pulcherrimus*—is the only anopheline in evidence during the chief malarial season, and it is not an intense carrier. It would seem that most of the cases occurring locally acquired infection either at Basra, Kurna, or some place on the journey up the Euphrates. At the same time conditions may alter and it is important that all possible breeding places should be kept under supervision. In this connection it may be possible to utilise Major Patton's entomological knowledge. Special attention should be directed to the numerous borrow pits which have been excavated and to those localities liable to flooding when the river is high.

4. It is important to ensure that malarial convalescents are given a sufficient course of quinine treatment in order to prevent relapses. For this purpose each case on leaving hospital should be given a paper to enable him to obtain quinine from the medical officer of his unit. This method was already in vogue at No. 3 Combined Field Ambulance. A convenient rule for Medical Officers to follow would be, that, supposing the patient has had a month's treatment in hospital he should continue to take 10 grains daily for another month, and 5 grains daily throughout a third month.

5. *Oriental Sores*.—Lieutenant-Colonel Wenyon and Lieutenant Naidu have found *Leishmania tropica*, the parasite responsible for the condition, in the case of a British officer and also in one case amongst 13 men of the 2/5th Gurkhas now suffering from cutaneous sores. Although the parasites were only found in the one case the others were undoubtedly of the same nature, *Leishmania tropica* being difficult to detect in an oriental sore which has commenced to suppurate. The parasite was also found in the case of another British officer at railhead. It is very necessary that the 16th men of the 2/5th Gurkhas who are at present invalided owing to their skin lesions should be admitted to hospital, both to prevent possible spread of the disease to others and for purposes of radical treatment. As flies are suspected of being able to transfer the parasites to other uninfected wounds and abrasions the sores should be protected from these insects.

6. *Scabies*.—A certain amount of what is regarded as scabies has recently occurred amongst some of the Indian units. There appears to be some doubt as to whether the condition is true scabies or a form of impetigo. It would be well to settle the question by determining the presence or absence of *Sarcoptes scabiei* in the skin lesions. If the acarus is found we think the new and rapid treatment for scabies by means of sulphur fumigation should be tried if the necessary cabinets can be constructed.

7. *Heat Stroke*.—We were glad to find that at the 23rd Combined Field Ambulance, Major Lethbridge, I. M. S., had treated asphyxial forms of heat stroke by means of artificial respiration with a large measure of success. We think that the value of this method of treating cases with cyanosis and marked respiratory embarrassment is not generally sufficiently recognised, and that before the hot weather it would be well to remind medical officers that it is the only line of treatment which is effectual in this class of case.

8. *Bilharziasis*.—One case of urinary bilharziasis occurred in a sepoy of the 90th Punjabis; the disease is not uncommon amongst the native population. It does not seem likely that foci of infection exist in the immediate neighbourhood of Nasiriyah, but it would be well to make certain by instituting a search for the snail hosts both of *B. haematobia* and *B. mansoni*. This might be entrusted to Major Patton. The investigation should certainly be carried out in the swampy regions down-river and near Junction Camp, Suk, and Hakika where both *Bullinus* and *Planorbis* are likely to occur.

WATER-SUPPLY.

9. While the present system continues (shallow wells by the side of the Euphrates) chlorination has to be carried out in a large number of different places and there is need for better supervision of this work. The Assistant Director, Medical Services, proposes to appoint a medical officer specially for this purpose, who will see that the responsible man at each place fully knows the routine, and is supplied with satisfactory apparatus or bleaching powder solution. This officer will also make frequent control tests with iodine and starch and arrange with the laboratory as to bacteriological tests.

10. Lieutenant-Colonel Greenstreet showed us the plans for the *new piped supply* for Nasiriyah which has been sanctioned by the Army Commander and will be proceeded with when the material arrives. The following were noted.

(a) The projected series of small chlorinating tanks could apparently be dispensed with if the storage tank is partitioned and the pump can draw separately from each section of the tank.

(b) The previous rough sand filtration could in that case be carried out in a smaller number of filters. Filtration of the sedimented water may only be necessary at certain seasons and there should be means of passing the water direct from sedimentation to storage tank. It should be possible to take separate samples from each filter for laboratory examination.

[Note :—Jan. 18, Since the above was written we have seen Capt. Morison who has made a special visit to Nasiriyah on the above matters. The arrangements in paragraph 9 have been made. The recommendations in paragraph 10 can now be ignored; a better scheme of supply which includes use of a Ransome filter for the right bank has been recommended. Several such filters are on the way to Mesopotamia. It will be well to allot a second mechanical filter, when practicable, for the supply of the left bank. In anticipation of these filters the necessary settling tanks should be prepared at once.]

11. We suggested that the minimum depth of the mains below ground should be two feet so as to provide against excessive heating of the water in the hot weather.

12. It is understood that a sufficient supply of acid sodium sulphate tablets will be obtained, so that these may be issued for use in water bottles in emergency, *e.g.*, an advance over new ground where polluted water alone is available.

LATRINES AND INCINERATORS.

13. In Field Ambulances and Hospitals the latrines were found to be very good and the incineration was carried out in a satisfactory manner. Elsewhere conditions left something to be desired, either in the way of latrine construction (*e.g.* 1-5th Queens) or of the method of incineration.

As regards latrines, some form of head cover should be provided before the wet weather begins and in the case of latrines for British units it is desirable to introduce the system which combines a fly-proof seat and a sliding kerosine can. There should be a regular issue of toilet paper and a supply, placed in a suitable receptacle, should be available alongside each latrine seat.

Closed incinerators have been, or are being constructed for burning excreta during the rains. These appear to be of a good type. On the left bank horse litter is dealt with separately by a modification of Roubaud's system; as a result the litter burned in the latrine incinerators is only that required for use as fuel. On the right bank in several instances a common incinerator of the open Raitt pattern is often used for dealing both with excreta and litter. Consequently it is often some considerable time before the fire reaches the tin contents which have been dumped on the top of the litter, and in the interval flies gain access to the faeces. The same thing happens when litter and excreta are mixed and allowed to remain for some time on the ground before being incinerated.

We understand that a central area for dealing with horse manure is to be introduced for the camps on the right bank, and we hope this will be expedited.

14. In order to facilitate the latrine work it is a good plan to house the sweepers close to the sanitary area as is done at 105 C. F. A.

There is much need of an ample supply of incinerator bars and we trust these will be provided at an early date.

COOK-HOUSES.

15. The essential principles governing the construction of cook-houses and cooking shelters have been mentioned in the course of our inspections. We propose to forward a copy of a plan of a type of cook-house which has been found useful elsewhere.

GENERAL SANITARY CONDITION OF CAMPS AND THEIR SURROUNDINGS.

16. On the whole this was quite good but here and there evidence of bad sanitary discipline was apparent. Attention is specially directed to the camp of "B" Battery, 222nd R. F. A., where food refuse was lying about and other evidence of dangerous untidiness was noticed. We learnt that on several occasions this unit has been reported to have neglected essentials of camp sanitation and that the incidence of disease associated with such neglect—enteric and dysentery—has been high. This battery has not only been needlessly contracting sickness, with consequent inefficiency, but has been a very probable source of infection to other units in adjoining camps. Effective measures should be taken to put an end to this state of affairs. The battery is said to have been "spoiled" in India where Indian sweepers did the cleansing of the quarters and lines. In Mesopotamia all sweepers are required for the essential latrine work, and this should be realised by the battery.

17. Some of the *chatai* huts (*e.g.* 90th Punjabis) required better ventilation.

18. The surroundings of the camps need more systematic inspection and work by the Sanitary Section specially as regards casual accumulations of litter and unburnt empty food cans which were too often seen lying about.

The Officer Commanding the section represented to us that his work was much hampered by (*a*) the absence of the official equipment of tools, etc. and (*b*) the lack of carts. Both matters seem to need attention.

DISINFECTION.

19. The Committee propose to represent at Basrah the value of a Railway Steam Disinfecting Van (as in Egypt), to be used on the Nasiriyah section of the new line. This should be of great service in rapidly dealing with lice on a large scale.

RATIONS.

20. We understand from the Assistant Director, Supply and Transport, that every effort is being made to secure sufficient wood for fuel, shortage of which has been almost the only important deficiency in the recent rations. Here, as elsewhere, it is important in regard to scurvy, that, in Indian units, quartermasters and medical officers should know accurately the details of the rations authorised and drawn, and also should ascertain what items of the rations are being actually taken and used by the men.

HOSPITALS.

21. Lieutenant-Colonel Wall, I.M.S., explained to us the work which is actively in progress to complete the conversion of the Turkish Barracks into a hospital for No. 83 Combined Stationary Hospital. It is understood that this provides for the whole British accommodation being within the buildings and not in the outside huts or tents.

22. A separate Thresh Disinfector is needed for this hospital.

23. As regards the Isolation Hospital, we consider the provision of hutting against next hot weather is essential and fully support the proposal for hutting 50 British and 100 Indian which the Assistant Director, Medical Services, has put forward.

LABORATORY.

24. Excellent work is being done in this laboratory by Lieutenant Naidu in spite of the fact that he has had no trained assistance. We understand that an Indian attendant is to be attached to him after a few weeks' training at the Central Laboratory, Basrah. The lack of suitable peptone, sugars, and high titre serum has seriously interfered with the diagnostic work and we hope that such supplies will soon be forthcoming. There is a standing arrangement for the dispatch of blood samples from the Field Ambulances and Stationary Hospitals for cultural diagnosis in enterica, and Lieutenant-Colonel Ledingham has taken the opportunity of discussing fully with the Bacteriologist certain practical methods for the procuring and manipulation of samples of excreta in dysentery and enterica. Lieutenant Naidu has preserved full clinical notes and temperature charts of enterica cases submitted to him for bacteriological enquiry and he has arranged to make a preliminary analysis of these with special reference to inoculation data, etc. Similar analyses of cholera cases and jaundice cases have been made and, in the latter disease, blood films have been examined for the possible presence of spirochaetes though with negative results. In view of the continual cropping up of jaundice cases we would recommend that (1) careful clinical records and histories be preserved in all, and (2) that every effort should be made to secure bacteriological aid in the elucidation of those puzzling cases. In connection with (2) it would be useful to have a stock of guinea-pigs and rabbits for which there is ample accommodation in the Laboratory Compound.

25. Microscopes should be provided for any Field Ambulances which at present lack them; *e.g.*, 23 C. F. A, which could itself deal with the examination of malaria films. The installation of the telephone at the Laboratory would very materially assist the bacteriologist in his work and would enable him to, communicate directly with units regarding samples and reports.

MUNICIPAL SANITATION AND DISPENSARY.

26. It was evident from our inspection made with the Military Governor, Major Waller, and the Medical Officer for the town, Captain Scott, I.M.S., that much good work has been and is being done under this head. The Arab

public latrines require better supervision to see that the sweeper does not absent himself and that he empties and burns the contents of the latrine tins promptly. Experimentally one or two deep trench cess-pits of the same general type as those in use in the houses in the town might be substituted for the present type of public latrine and incineration. If successful these should be multiplied.

27. The arrangements for collecting information as to civil deaths (of special importance as regards cholera and plague) might usefully be supplemented by a system of requiring permits for burial. This has been found a useful check at Amara and elsewhere.

28. The suggestion of a general stabling ground for all horses in the town has much to commend it on the ground of sanitation and prevention of flies.

29. Day to day inspection is of great importance. We would advise that the Medical Officer should be relieved of his regimental work as to give to sanitary duties that part of his time which is not required for the civil dispensary. There would be much advantage in the town possessing a British non-commissioned officer who is a trained Sanitary Inspector, and we propose to enquire at Basrah if any such man could be spared from the British Sanitary Companies, as also with regard to measures for strengthening the British portion of the Divisional Sanitary Section.

Nasiriyah,

December 26th, 1916,

Appendix 2.

MEMORANDUM ON CERTAIN POSTS ON THE EUPHRATES BETWEEN NASIRIYAH AND KURNA.

Brief visits were made on our return journey to Hakika, Suk, and Junction Camp, December 26th to 27th.

1. *Hakika*. (recently taken over by 1 company, 23rd Erinpuras).—The chatai huts required considerable improvements to make the small compound more satisfactory for the wet season. The Officer Commanding had this in hand, and proposed to thin out huts which are not required. We advised here and at other posts that available barrels should be turned into "Serbian" disinfection barrels to deal with lice; also that vermijelli should be obtained and issued.

Fleas are stated to be very troublesome at these posts, probably living in the chatai matting. It is difficult to suggest remedies with huts of this construction. Tricresol powder or powdered naphthaline, if either is available, might be tried. The naphthaline should be scattered freely over the matting and left in the closed hut for 24 hours before its occupation. For infected rooms or dugouts, cresol fumigation can be adopted where the plague of fleas is great and is not removed by ordinary methods of cleansing. One ounce of saponified cresol for every 100 cubic feet may be used.

The company was relying for water purification on a bottle of chlorine water brought with them from Amara. It is important to arrange for a regular supply of standardised bleaching powder solution.

2. *Suk*. (Half company, 112th Infantry).—The men are closely packed in a badly ventilated building, and the rest of the area inside the fort is very small. The force was shortly to be increased to a whole company, and if this is to be the normal strength, it will be important on health grounds to take in a larger area within the protected perimeter, or to house a portion of the force elsewhere.

Latrines and incinerators wanted reconstruction. The Officer Commanding the half company was under the impression that any wood, etc., for this purpose would have to be obtained by river from Nasiriyah through the Field Park, where such material is by no means abundant. We think it probable that through the agency of the Political Officer material for this purpose, and other material which would improve the amenities of life in this small garrison, could be obtained by purchase from the large town of Suk adjoining, and suggest that this should be looked into.

For chlorination of water and disinfection, see above. The half company consisted of Jats and the meat ration was not being drawn. The objection of Jats to meat-eating on service conditions has been overcome elsewhere, and the matter is important in view of the past experience of scurvy. Should there be difficulty in pressing the meat ration, a fresh milk supply from Suk might well be obtained in lieu.

3. *Junction Camp*. (Main body of the 43rd Erinpuras and small units including a Section of No. 83 I. S. H., the Officer Commanding which, Captain Stocker, I. M. S., had just received orders to transfer his unit to Nasiriyah).—The Military Officer in charge Erinpuras, is responsible for the camp and also visits Hakika and Suk when necessary. There is need for a Sub-Assistant Surgeon at this post. No disinfectant is available and the installation of Serbian barrels was advised. Suitable barrels will be available once the hospital has left.

The water supply is drawn from the channel leading to Suk and is consequently not likely to be contaminated from steamers tying up in the main river round the corner from the intake. A couple of 200 gallon tanks are in use. Precipitation with alum and chlorination is carried out in a single tank, the two tanks being used alternately. It would be an advantage if two more tanks of the same capacity were provided. The Officer Commanding said he would procure them as soon as possible. The starch and iodine test is not at present employed but will be applied when the zinc iodide and starch solution is available.

The present latrines are very unsatisfactory but new covered latrines are to be built on two raised sites. The existing incinerator is covered after a fashion. A special incinerator for rubbish is to be built.

The site of the camp generally is a very difficult one but the Officer Commanding, who has had considerable experience of similar places intends, to carry out certain improvements which should certainly help to render the camp more healthy.

The general arrangements at the Section of No. 83-I. S. H., a hospital accomodating 192 patients, British and Indian, struck us as exceedingly good. At the time of our visit there were only 2 British and 6 Indian patients. The hospital has been at Junction Camp since July 14th, 1915. It is interesting to note that not a single case of paratyphoid or dysentery acquired locally had been admitted to it. The chief diseases treated had been scurvy (acquired elsewhere) and sand-fly fever. Two cholera cases had been admitted, both from river boats. A new hut had been provided for the staff.

MALARIA RISKS AND PRECAUTIONS.

4. This subject, as regards the posts mentioned and other posts in the water-way of the Euphrates, has lately been reported on by Major Christophers of the Basrah Central Laboratory, and no further observations seem called for here.

BASRAH,

31st December 1916.

Appendix 3.

MEMORANDUM ON INSPECTIONS AND INQUIRIES AT AHWAZ. (KARUN FRONT.)

1. The Committee arrived at Ahwaz on January 4th, and carried out a series of inspections on the four following days. They received every assistance from the General Officer Commanding, Brigadier General Young-husband, from Captain Edwards and from the S. M. O. Major Falk, I. M. S., as well as from the Officers Commanding the various units and departments inspected. The post at Ahwaz is situated on the right bank of the Karun River opposite the town of Nasiri. It occupies a considerable space within the perimeter. Inside the latter and adjacent to the camp on the north are the ruins of the Arab village of Aminiah, utilised at the time of our visit as a site for isolation huts and tents for small-pox cases. In dry weather the site of the camp is a good one save for the presence of some borrow pits which, however, are being filled up. When it rains, the surface soil becomes very sticky and a certain number of pools form but these as a rule soon dry up. The general lay-out of the camp, situation of hospital etc., are satisfactory from a sanitary standpoint though it is noteworthy that the latrines and incinerator areas are remarkably far away from the units which they serve (*vide* paragraph 15).

2. At the date of our visit the garrison consisted of some 150 British and 2,500 Indian troops including followers. The post has been occupied from April 1915 and the force has more than doubled since this time last year. Part of the Karun Force also occupies small posts further afield, including that of Band-i-Qir which we visited. Hospital accommodation is provided by C. & D. Section of No. 4 C. F. A.

3. The number of sick in hospital from all causes during the second half of 1916 has usually been from 50 to 60, the monthly rates of average daily sick to total force in successive months from June to December being approximately 4, 4.3, 5, 3, 3.3, 3.3 and 2.5 per cent. There were 115 cases in the hospital, which was somewhat overcrowded. This, however, was due to delay in evacuation owing to the non-arrival of a steamer and medical officer and was remedied during the course of our stay at Ahwaz. The diseases most in evidence at present are jaundice, diarrhoea, dysentery and fever. The fever cases, in the absence of a microscope and other facilities for definite diagnosis, are usually classed as N. Y. D., P. U. O., or malaria. It would seem, however, that some of them at least belong to the enterica group. The fact that there is no marked splenic enlargement and that the temperature rises in the late afternoon is against malaria. No anophelines are now present and other mosquitoes are rare. In the autumn two species of anophelines were observed. One was *A. pulcherrimus*, the other a small anopheline; Major Falk did not think that the latter answered to *A. stephensii*.

Sandflies were very bad in the summer and autumn and many cases of sandfly fever occurred.

SMALL-POX—VACCINATION AND PRECAUTIONS ADVISED.

4. Six recent cases of small-pox (5 Indian, 1 British) were reported at Ahwaz and other two cases occurred during our visit.

Infection in the earlier cases appears to have been contracted outside the camp; small-pox being prevalent among the native populations of Nasiri, Dizful and elsewhere. The occurrence of these cases was a matter of some concern as it was evident that the vaccine lymph available has been largely inert.*

*See previous report Line of Communication, November 1916 Appendix 5.

The lymph in question was supplied from the Base Medical Stores at Basrah early in December. A new supply of lymph was telegraphed for from Basrah. 500 doses arrived on January 10th and additional supplies were promised.

The vaccination work needed some systematising. We advised that vaccinators scarify in at least two places, together giving a total area of about half a square inch that all vaccinated men should be inspected by the Medical Officer on the 6th day and the results noted; and that the results of vaccination, showing if successful or not, should in all cases be noted in the mens' paybook.

Small-pox cases were being isolated in the former 23rd Cavalry Hospital hut and some tents, etc., around it. The place is in process of being arranged

and equipped from No. 4 C. F. A. for some 15 to 20 cases with attendants. A British Medical Officer and two British orderlies were telegraphed for and arrived on January 10th. We also advised that in case of a possible further spread the main arrangements necessary for a tented hospital outside the perimeter should be worked out. Regimental medical officers were advised to watch closely for the earliest signs of small-pox and for the time being to secure the immediate isolation of cases with fever, headache, backache or other symptoms, suspicious of early small-pox, until the diagnosis is cleared up. This seemed a more important measure in the circumstances than attempting to isolate men on suspicion of having been more or less in contact with previous known cases. We also advised as to the measures of disinfection which should be adopted in the absence of a steam disinfecting apparatus. The latter is urgently needed.

The Deputy Director of Medical Services, Lines of Communication, visited Ahwaz on January 10th and took steps to secure preventive action in the above and other directions. Some emergency measures were also found to be necessary in connection with the small-pox case which had occurred at Band-i-Qir.

JAUNDICE.

5. Since August 1915 there have been 92 admissions to the Field Ambulance for jaundice, 68 of these being Indian Infantry, 16 Indian Followers and 8 British Details. Considerably more than half the cases were reported during the 9 weeks ending 5th January 1916. Thus since November 1915 to the present date, 5th January 1917, there have been 53 cases in all and 34 of these occurred during December 1916. We are informed that all the cases have been of a benign nature; no instances of severe toxic jaundice simulating Weil's disease have been reported.

SCURVY.

6. Since 4th March 1916, when the Senior Medical Officer reported on this question, 25 cases of scurvy have occurred among Indian fighting men and 4 among followers. Of these, 13 were admitted in March, 2 in April, 1 in June, 8 in July and 5 in subsequent months:—20 were transferred to other hospitals and 9 were returned to duty. (See note as to rations below.)

ORIENTAL SORE.

7. A considerable number of intractable skin ulcers have occurred in this area and have been regarded clinically as oriental sore. During our stay here a microscopical examination of six such cases was made with the result that one showed the presence of *Leishmania*. This case had been at Ahwaz only a few weeks and it is very probable that he acquired his infection elsewhere.

DYSENTERY AND DIARRHOEA.

8. From the A. and D. records of Indian Fighting men at the Field Ambulance during the period, July 26th, 1915 to January 7th, 1917, 183 cases in all of dysentery and diarrhoeal disease (70 dysentery, 87 diarrhoea, 26 colitis) have been treated, being 18.6 per cent. of the total admissions (983).

BRITISH SICK.

9. There have only been 38 admissions of British sick during the period, 4th November, 1915 to January, 1917. Of these, 9 were cases of malaria and 6 of dysentery and diarrhoeal disease. No cases of heat stroke were reported.

HOSPITAL.

The two sections of No. C. F. A. officially provide 50 beds but there is accommodation for 96 at present. With the exception of a few tents for isolation purposes the patients are housed in huts well built of mud bricks and efficiently roofed. These huts which are of two sizes are of local construction and are of a very good design considering the difficulties encountered as regards labour and material. They should now be provided with good brick floors. We understand that plenty of bricks are available. The huts are well spaced and arranged and were found a great boon in the hot weather. We believe that it is intended to send part of a casualty clearing station to Ahwaz. If No. 4 C. F. A. is moved elsewhere the casualty clearing station might very well utilise the existing huts. In addition however there is ample space for the erection of more huts immediately to the west of the present hospital site.

We have conferred on this subject with Captain Wildebloode, the Field Engineer who has recently arrived at Ahwaz.

The hospital Staff of No. 4 C. F. A. should be strengthened by the addition of British orderlies. Some of the personnel of this unit have been two hot weathers in Mesopotamia, and in the interest of efficiency it would be well that they should have leave.

II. INOCULATION WITH TRIPLE VACCINE.

Only a few smaller units have received this vaccine. It is proposed to commence shortly with the systematic inoculation of the larger units, though some difficulty is anticipated in persuading certain Indian regiments of its utility as a protective agent. It does not appear from the A and D records or from the impressions of the Field Ambulance Officers that enterica has prevailed to any extent in this section. We were shown a few cases of "P. U. O." however, the charts of which strongly suggested paratyphoid infection though marked.

LABORATORY FACILITIES.

12. No facilities of any kind have been available in this station for microscopical or bacteriological diagnosis though the Field Ambulance has been in existence for two years, and the distance from Basrah and the irregularity of sick transport frequently necessitate a prolonged stay of infectious cases in the Ambulance. We understand that a second class laboratory is to be allocated to this station, to enable the carrying out of microscopic diagnosis, in such diseases as malaria, oriental sore, etc. In the meantime a microscope with staining requisites is urgently required for this station. Both the officers belonging to the Field Ambulance have had considerable experience in clinical microscopy and bacteriology.

WATER SUPPLY.

13. This is obtained by pumping from the Karun at a point above the camp. The situation of the intake is good, and the water, though at this season very turbid, should be reasonably free from dangerous pollution.

The water is settled (with the aid of alum) in 12 tanks of total capacity 3,400 gallons. It is fetched from these tanks in pakhals and other receptacles and a dose of bleaching powder solution, adjusted to the size of the vessels, is added to each receptacle as it is taken away, with more or less regularity. The present system of adding alum and chlorine seemed to us by no means reliable. Moreover the distribution of water involves much unnecessary labour and also man-handling which might easily cause infection.

It would be best (as now proposed by the Field Engineer) to utilise the tanks as service tanks in the lines, and to substitute at the intake larger tanks (cement, metal, or temporarily of rubber-canvas tarpaulin) in which sedimentation and chlorination can be successively carried out. The chlorinated water should then be pumped to a service tank for supply of the whole camp. Until pipes are available, the water could be taken to the service tanks in the lines by water or tank carts. We recommend that three such carts should be provided at once.

It is important that these alterations should be carried out as soon as possible. The chemical treatment should be directly controlled by a responsible medical officer.

ABLUTION.

14. It is very desirable that means of ablution with hot water be provided for the British Units. The Field Engineer is to erect an ablution shed and we promised to recommend at Basrah the supply of metal bath tubs. We hope these will be sent without delay now that the cold weather increases the risk of leishmaniasis. A drying room or tent for dealing with clothes of the men of the Mechanical Transport is urgently required. It can easily be improvised as we understand stoves are now available.

LATRINE AREAS.

15. As already stated, these were in every case situated a very considerable distance from the different camps. There was, however, no evidence that this led to any fouling of the camps or their immediate precincts. It is probably therefore all for the good.

The latrines themselves are of a very rudimentary type. They should be provided as soon as possible with head cover and it would be an advantage

to have the floors bricked, at least in those used by British Units. The "abdust" pits are open. They should be covered and the channels leading to them lined with tin.

The incinerators are open, and in wet weather function badly. We have seen the Field Engineer about the provision of closed incinerators. He proposes to erect a few of a modified Amara pattern which should answer well. A few sheds for keeping fuel litter dry have been erected. One should be provided for each sanitary area; as should a shelter for the sweepers in attendance. The dangerous practice of mixing faeces and litter on the ground and leaving it lying in heaps until such time as the sweepers have time to transfer the mass to the fire was generally in vogue. We explained its risks and had it stopped. Litter has in the past been burned in ridges. At the time of our inspection there was a large accumulation, supplied as fuel for a brick kiln but not used. The Field Engineer proposes to construct for litter some open cone incinerators, plans of which have been furnished to the Senior Medical Officer. Flies were exceedingly prevalent in Ahwaz last autumn and it is very necessary that every precaution should be taken before the spring breeding season. It would be well that one of the fly experts should visit this post not later than March and give instruction and advice.

HUTTING.

16. The 97th Infantry are quartered in excellent huts built of mud bricks and well roofed. The rooms were rather overcrowded, in some instances there being 45 men per hut. The ventilation of the huts also is by no means satisfactory and the Field Engineer is to arrange for the provision of ventilation under the eaves both in the case of these huts, those to be erected in the lines of the 8th Rajputs, and those which are in use elsewhere. All the units except the 8th Rajputs and a few of the 23rd Cavalry, have been provided with huts, an excellent bit of work.

RATIONS.

17. The ration arrangements appeared satisfactory and need no comment. The vegetable garden started at Nasiri last year has been of very great advantage. The 43rd Erinpuras who were in Ahwaz up to March 1916, suffered considerably from scurvy, and it is probable that the supply of vegetables from this garden during the hot weather and subsequently, prevented the continuance of this disease among the Indian troops after this date. Other measures, such as the local increase of the meat and fuel allowance, which were taken in consequence of the appearance of the scurvy, no doubt also contributed to this result.

The General Officer Commanding informed us that he would welcome advice from one of the gardening experts as to future planting and developing of the garden, and we think it would be useful if this can be arranged at an early date. The present output of the garden is about 400 lbs. of vegetables daily.

RISKS FROM CIVIL POPULATION.

18. The proximity to Ahwaz of the large native town of Nasiri, the employment in the camp of native labour recruited from its populace and the prevalence of infectious disease, especially small-pox, amongst the latter, make it necessary to take every means of safe-guarding the garrison from the risk of acquiring infectious diseases, such as small-pox, cholera, plague, etc., from native sources. Nasiri is a very dirty town, sanitation being non-existent and there being no means of instituting reforms at present.

We think it would be a wise move to station a British medical officer, preferably with experience of tropical disease, in Nasiri. In all probability he would speedily gain the confidence of the natives and would then be in a position for acquiring information regarding infectious diseases both in Ahwaz town and Nasiri. Such information would make it possible to adopt precautionary measures at an early date. Administratively also, such an appointment (which might also be extended to medical work in Shuster) has probably much to commend it, and it would be well that the matter should be discussed with the Chief Political Officer.

We understand from Mr. Gillespie that the active help and co-operation of the Anglo-Persian Oil Company was assured in the event of this scheme being carried out. General Younghusband expressed himself as greatly in favour of such an arrangement.

January 1917.

Appendix 4.

NOTES ON VISITS TO THE BRITISH AND INDIAN CONVALESCENT DEPÔTS, MUHAMMERAH.

On December 15th, 1916 the Committee paid a brief visit to the British and Indian Convalescent Depôts at the mouth of the Karun river near the Persian town of Muhammerah. At that date, though the British Depôt had been in existence for some time, the Indian Depôt was only in course of formation.

A second visit was made on January 12th 1917 when it was found that the Indian Depôt had been completed and was in full working order.

We understand that the present intention is that both these institutions should only serve cold weather needs and that they will come to an end in April next. Hence it does not appear necessary to enter into much detail regarding them.

British Convalescent Depôt and Hospital.—The site is excellent and has been laid out to the best advantage.

We were very favourably impressed by the general arrangements and the work accomplished by Captain Gosse, R. A. M. C. (T.), and his staff.

The following points appear to merit attention:—

1. No particulars regarding the convalescent patients are usually sent from Basrah beyond the nominal rolls and the clinical diagnosis. It is very desirable that full clinical notes, by means of the case papers or otherwise, giving information as to previous treatment and diet, should be forthcoming. This is specially important in the case of malaria and dysentery convalescents, as a certain number of these patients have to be transferred from the Depôt to the local hospital owing to relapse.

2. The treatment of the malaria convalescents is not satisfactory. Ten grains of quinine given on two successive days per week during the period of detention is not sufficient to prevent relapse in all cases. Unless there are good reasons to the contrary ten grains daily should be administered and when the patient is discharged he should be given a note so that his quinine treatment can be continued in smaller doses.

3. The Depôt should be provided with a microscope and staining requisites. The lack of such facilities has been keenly felt, especially in the diagnosis of cases of malaria and of amoebic dysentery in which emetin treatment requires to be continued.

4. A fly-proofed shed should be provided for the hanging of meat.

5. A small building for the storage of bread would be an advantage.

Indian Convalescent Depôt and Hospital.

In the interval between our two visits Captain Denham White, I.M.S., had carried out a great deal of useful work in the way of rendering the site more habitable and protecting it from flooding. The general arrangements appeared to us to be quite satisfactory.

BASRA :

January 14th 1917. }

Appendix 5.

NOTE ON OIL COOKING FOR INDIAN TROOPS.

This system is at present employed by the detachment of Indian Infantry at the Oil Fields.

An ordinary cylinder or petrol can filled with oil is kept near the cook-house and to this is attached an iron pipe of small diameter: this pipe leads into a hole cut in the ground and plastered with clay. To regulate the drip of the oil a cock is welded on a few feet before the pipe reaches the hole.

The sketches attached show principle.

AHWAZ:

10th January 1917. }

H. RADCLIFFE SMITH, CAPTAIN,

General Staff, Karun Force.

Note.—The two sketches attached by Captan Radcliffe Smith are not here reproduced. The first shows an ordinary oil drum on the ground and a small Indian cooking pit dug out of the earth about 6 feet away. The two are connected by a metal pipe, which near the end of its length goes below the ground to terminate half-way down the pit. A stop-cock to regulate the drip is placed on the pipe before it goes below ground. The second diagram shows the pit, which is covered by an iron plate supported on an edging of bricks. The hot plate serves for cooking the chupatties and for other cooking required.

BASRA:

14th January 1917. }

Appendix No. 6.

ANALYSIS OF CAUSES OF SICKNESS AT NASIRIYAH AT NO. 83 COMBINED
STATIONARY HOSPITAL.A. ANALYSIS OF ADMISSIONS FROM 19TH JUNE TO 15TH DECEMBER 1915.
(*British Rank and File.*)

Enteric Group	81	139
Paratyphoid (sic)	8	
Paratyphoid A.	33	
Paratyphoid B.	17	106
Colitis	95	
Enteritis	4	
Dysentery	5	2
Diarrhoea	2	
Effects of heat	79	
Malaria	77	
P. U. O.	66	
G. S. W.	49	
N. Y. D.	38	
I. C. T.	36	
Jaundice	37	
Sandfly fever	23	
Cholera	23	
Hepatitis and Liver congestion	12	
Liver abscess	1	
Gastric	10	
Venereal	10	
Anæmia	9	
Accidents	8	
Cardiac	7	
Skin	7	
Pulmonary	6	
Boils	2	
Beri-beri	1	
Miscellaneous	63	
Total analysed	809	

B. ANALYSIS OF ADMISSIONS FROM 13TH JULY TO 13TH DECEMBER 1916.

(Indian fighting men and followers.)

Colitis	103	129
Enteritis	10	
Dysentery	2	
Diarrhoea	14	26
G. S. W.	105	
Jaundice	73	
Pulmonary	64	
Malaria	55	
Venereal	49	
P. U. O.	45	
Scurvy	37	
Debility	37	
I. C. T.	31	
Rheumatism	30	
Eye	27	
Anæmia	26	
Enteric Group	21	26
Paratyphoid A.	5	
Effects of heat	24	
Accidents	23	
Skin	18	
Mental	12	
Guinea-worm	10	
Sandfly fever	8	
Cholera	6	
Beri-beri	1	
Liver abscess	1	
Bilharzia	1	
Tuberculosis	5	
Pyorrhœa	5	
Miscellaneous	112	
Total analysed	960	

Appendix No 7.

MEMORANDUM AS TO ORIENTAL SORE IN MESOPOTAMIA.

Oriental Sore, known locally as "Baghdad Sore" (native *Uchut*) has long been known in Mesopotamia and Persia. Though most commonly met with in the large towns such as Baghdad, Musul, Aleppo, Tehran, etc., it is present in lesser degree in the smaller towns such as Basrah, Kurna, Amarah and Nasiriyah. Cases (both British and Indian) which have been diagnosed by the discovery of the causative organism *Leishmania tropica* have recently come to light in Nasiriyah and outlying parts, Basrah, Kurna and Amarah and further up the Tigris. From the length of stay of the infected individuals in these localities there is no doubt that the infection had been contracted in the places named. The disease undoubtedly exists up the Karun river, though the only case diagnosed at Ahwaz by the finding of the parasite had possibly been imported.

The exact method of introduction of the organism into the skin is not known but evidence points to the agency of some biting insect, possibly the sandfly.

The disease can be produced by direct inoculation and presumably a healthy person can develop a sore on the site of an abraded surface which has been directly contaminated by matter from an oriental sore. House flies may possibly convey infection in this way. In Persia the disease has been proved to occur in dogs.

The disease is essentially a chronic one and lasts from 6 to 12 months. One attack confers immunity. The sores are most apt to occur during the autumn, infection, probably having taken place a month or two previously.

The parts of the body affected mostly are those exposed to biting insects the face, the arms below and including the elbow, and the leg below the knee. Other parts, however, are occasionally involved.

The lesion is frequently a single one though the presence of two or three sores is not uncommon while a greater number is sometimes seen. Autoinoculation may occur. The commencement is a small reddish brown papule often described as a mosquito-bite. Unlike the latter it does not disappear but increases in size and becomes covered with dry epidermal scales. In this condition it may be a dusky red soft tumour covered by thin epidermis. In size it varies from that of a pea to a grape. The central part of such a tumour may break down and produce an ulcer which has red raised edges and central granulations. If left alone a scab readily forms beneath which there accumulates pus if secondary bacterial infection has taken place as most often occurs. These ulcerating sores may extend, often tending to heal at one part while spreading at another till an ulcerating area a couple of inches or more in diameter may result. The non-ulcerated dusky red raised area may not break down but show a tendency to dry up towards the centre leaving a dry crust surrounded by a red border. The removal of the crust in such cases exposes pale red granulation tissue and allows the escape of a thin fluid rather than pus. Such forms may gradually dry up and disappear without any actual ulceration having taken place. After healing the site of the sore is marked by a thin white scar the "date mark" of this country.

The absolute diagnosis of the lesion, which may simulate many skin ulcerations, can only be made by the discovery of *Leishmania tropica*. This is usually an easy matter in the non-ulcerating types but when secondary bacterial infection has led to pus formation the discovery is much more difficult. In every case an attempt should be made to obtain tissue from beneath the ulcerating surface. This can be done by cleaning away the pus and scraping rather deeply or better by puncturing the skin on the red margin and running in a fine glass pipette so as to procure tissue from beneath the ulcerating surface. The parasites are to be found in films of this tissue stained by Giemsa or Leishman stain and occur either free or in large mononuclear cells. Sometimes when films have failed to reveal the parasite diagnosis has been made by culture on blood agar after sterile puncture of the non-ulcerated periphery of the sore.

Treatment.—Many methods of treatment have been advocated.

Excision.—In certain cases the sore can be excised but it must be remembered that a good margin of healthy tissue must be removed for if any parasites are left behind a relapse in the scar will almost certainly take place and the last state be worse than the first.

Local.—Perhaps the most efficacious local treatment is the application of crystals of permanganate of potash. The sore is cleaned by the removal of scab and is covered with crystals of the drug. A dressing is applied and the cauterising action allowed to take effect. This is very painful for an hour or two. A slough forms and after its separation healing under a simple dressing should take place.

Carbon dioxide snow in the shape of a solid pencil formed by allowing the gas to escape into a tube of blotting paper or other receptacle may be applied. The diameter of the pencil should be about that of the sore and this should be pressed into it till freezing takes place. After one or two applications the sore should heal.

An ointment of tartar emetic (2 per cent.) similarly employed has given good results. Treatment with powdered tartar emetic, though somewhat painful, has also been used with success. The pain produced by some of these applications can be allayed by the local use for a few minutes before treatment of an anodyne mixture of equal parts of cocaine, menthol and carbolic acid.

General.—The intravenous injection of tartar emetic is now frequently employed. The solution is of 1 per cent. strength in distilled water. A dose of 5 to 10 cubic centimeters is given and repeated daily according to the progress of the case. As many as 10 injections can be given if necessary during the course of a fortnight or three weeks.

Prevention.—In the present state of knowledge, no measures of prophylaxis practicable under field conditions can be suggested save those in use for the prevention of insect bites generally. All oriental sores, or sores suspected to be of this nature, should, however, be kept covered with a dressing to prevent access of insects and risk of autoinoculation or direct inoculation to others.

It seems probable that many of the chronic skin conditions variously diagnosed as ulceration of the skin, I. C. T., etc., are in reality oriental sores.

BASRAH: }
January 1917. }

